## Questions for Class 11 (May 25) Mineral Matter 1 Chemical Engineering 733

Reading: ACERC red book, <u>299-322</u> Jenkins-Baxter paper

- 1. Please describe the CCSEM technique for mineral characterization.
- 2. Please explain the ternary diagrams in Figure 4.2.
- 3. What is the chemical fractionation technique for analyzing mineral matter, and why is it useful to industry? Please explain Table 4.1.
- 4. Explain what is meant by excluded versus included mineral grains, and why this may be important.
- 5. Calcium is one of the species that may cause low temperature fouling when there is sulfur present (CaSO<sub>4</sub> is formed). Based on bulk Ca analysis only (see p. 173 of Lee Smith book), which coals have the highest low temperature fouling potential? In practice, only the low rank coals tend to exhibit the low temperature fouling. Why is there a discrepancy here?
- 6. Please explain the differences between the top and bottom figures in Figure 4.3.
- 7. The Delta power plant is going to sell all of their ash to UTA to serve as road filler for I-15. The roads are to be 50 feet wide and have an effective depth of 1.5 feet. The ash comprises 10% of the road fill. What length of road can be made using one year's accumulation of ash from this power plant? Assume 1000 MW<sub>e</sub>, 34% efficiency, 10% ash (dry basis), Utah bituminous coal. You may also assume that the specific gravity of concrete is 2.5.